REMARKS/ARGUMENTS

In the Claims:

Claims 1-20 and 22-28 remain in this application. Claims 1, 4, 12, 13, 20, and 22 have been amended. Claim 21 has been canceled. New claims 26-28 have been added.

Claim Objections:

Claim 1 was objected to on the basis of minor informalities. Claim 1 has been amended to recite that decomposing portions of the sacrificial dielectric material forms a sacrificial dielectric decomposition product, and that portions of this product are removed. This clarifies that the sacrificial dielectric decomposition is a physical product of the decomposition.

Claim 20 was objected to on the basis of minor informalities. Claim 20 has been amended to recite that the contact structure comprises a metallic C4 structure. This corrects a grammatical omission formerly in the claim.

Rejections Under 35 U.S.C. 102(e):

Claims 1-10, 12-19, and 21-25 were rejected under 35 U.S.C. 102(e) as being anticipated by Grill et al. (US Patent No. 6,413,852) (hereinafter "Grill").

Regarding claim 1, the Examiner has mischaracterized the masking layer of Grill as disclosing, "forming a protective layer adjacent the interconnect," as recited in claim 1. Such masking layers of Grill are not formed adjacent the interconnect as recited in claim 1. In Grill, the interconnect does not yet exist when the mask layer is formed (see Grill, Figs. 1B, 1C; col. 5, lines 25-31). Rather, the mask layer is used to define cavities

150, 160 that will later be filled with conductors. Since the interconnect does not yet exist in Grill when the mask layer is formed, the mask layer can not be formed adjacent the interconnect as recited in claim 1.

Claims 3 and 6-10 depend from claim 1. Applicant thus requests that the Examiner withdraw the rejections of claims 3 and 6-10 for the reasons provided above.

Regarding claim 2, the Examiner has mischaracterized the dielectric layers 110', 120', 140' of Grill as disclosing, "forming a second layer of sacrificial dielectric material **adjacent the** at least two conductive layers and **first layer**," (emphasis added) as recited in claim 2. The Examiner has identified layers 110, 120, 130, 140 of Grill as the first layer of sacrificial material (Office Action, page 3, item 5). The dielectric layers 110', 120', 140' of Grill are not formed adjacent layers 110, 120, 130, 140, and thus are not formed adjacent the first layer of sacrificial material as recited in claim 2.

Regarding claim 4, Grill fails to disclose decomposing substantially all the sacrificial dielectric material at approximately the same time, as recited in the claim as amended. Since claim 4 depends from claim 2, claim 4 recites that both the first and second layers of sacrificial dielectric material are decomposed at approximately the same time. Grill, in contrast, discloses removing dielectric material between a first conductive layer (Grill, Fig. 1F) prior to forming an additional conductive layer (Grill, Fig. 1J) and prior to removing dielectric material between the additional conductive layer (Grill, Fig. 1K), which occurs in a later step.

Claim 5 depends from claim 4. Applicant thus requests that the Examiner withdraw the rejection of claim 5 for the reasons provided above.

Regarding claim 12, Grill fails to disclose that, "removing portions of the sacrificial decomposition product further forms air gaps between the vertical support structures and conductive vertical series," as recited in the amended claim. In contrast to forming air gaps, the dielectric sidewall spacers 210 of Grill are formed in contact with the diffusion barrier 170, which is in contact with the conductors 185, 182 (Grill, Figs. 1G and 1H). Thus, Grill does not disclose air gaps between the vertical support structures and the conductive vertical series.

Regarding claim 13, Grill fails to disclose, "forming, above air gaps between the conductive layers, a first capping layer to contact the vertical support structures and surfaces of the most highly positioned conductive layers within each conductive vertical series," as recited in the claim as amended. The layer shown in Fig. 1M and described in col. 7, lines 10-16 of Grill is formed above a sacrificial place holder material 220 (Grill, Fig. 1M), not above air gaps as is recited in the claim.

Claims 14-19 depend from claim 13. Applicant thus requests that the Examiner withdraw the rejection of claims 14-19 for the reasons provided above.

Claim 22 has been amended into independent form, including all limitations from the claim from which it depended, and states that the vertical support structures are isolated from the conductive series by air gaps. Grill fails to disclose vertical support structures that are, "isolated from the conductive vertical series by air gaps," as recited in the claim as amended. The sidewall spacers 210 of Grill are in contact with the diffusion barrier 170, which is in contact with the conductors 185, 182 (Grill, Figs. 1G and 1H).

Claims 23 and 24 depend from claim 22. Applicant thus requests that the Examiner withdraw the rejection of claims 23 and 24 for the reasons provided above.

Rejections Under 35 U.S.C. 103(a):

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Grill in view of Hsue et al. (US 6,696,222) (hereinafter "Hsue") and claim 20 was rejected under 35 U.S.C. 103(a) as being unpatentable over Grill in view of Greer (US 6,689,680) (hereinafter "Greer"). (Note that section 25 of the Office action, at page 7, states that claim 25 is rejected over Grill in view of Greer, but it appears that the Examiner intended to reject claim 20 over Grill in view of Greer. Correction is requested if Applicant is in error.)

Claim 11 depends from claim 1. As discussed above, the Examiner has mischaracterized the masking layer of Grill as disclosing, "forming a protective layer adjacent the interconnect," as recited in claim 1. Hsue fails to rectify this deficiency.

Claim 20 depends from claim 13. As discussed above, Grill fails to disclose all limitations of claim 13. Greer fails to rectify this deficiency.

Conclusion:

Applicant respectfully submits that claims 1-20, and 22-28 are patentable, and accordingly, the application is now in condition for allowance. Early issuance of the Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 500393. A Fee Transmittal is enclosed in duplicate for fee processing purposes. The Examiner is invited to call Michael Plimier at (408) 765-7857 if there remains any issue with allowance of this case.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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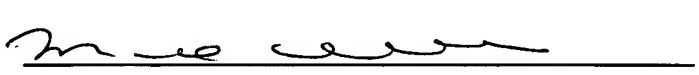

Michael A. Bernadicou
Reg. No. 35,934

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 765-8648